



Sacramento Regional County
Sanitation District

Need for a Comprehensive Delta Monitoring Framework as Part of the WQCP Implementation Program

Presented to the SWRCB by
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on behalf of SRCSD
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Why is a Comprehensive Delta Monitoring Framework Needed?



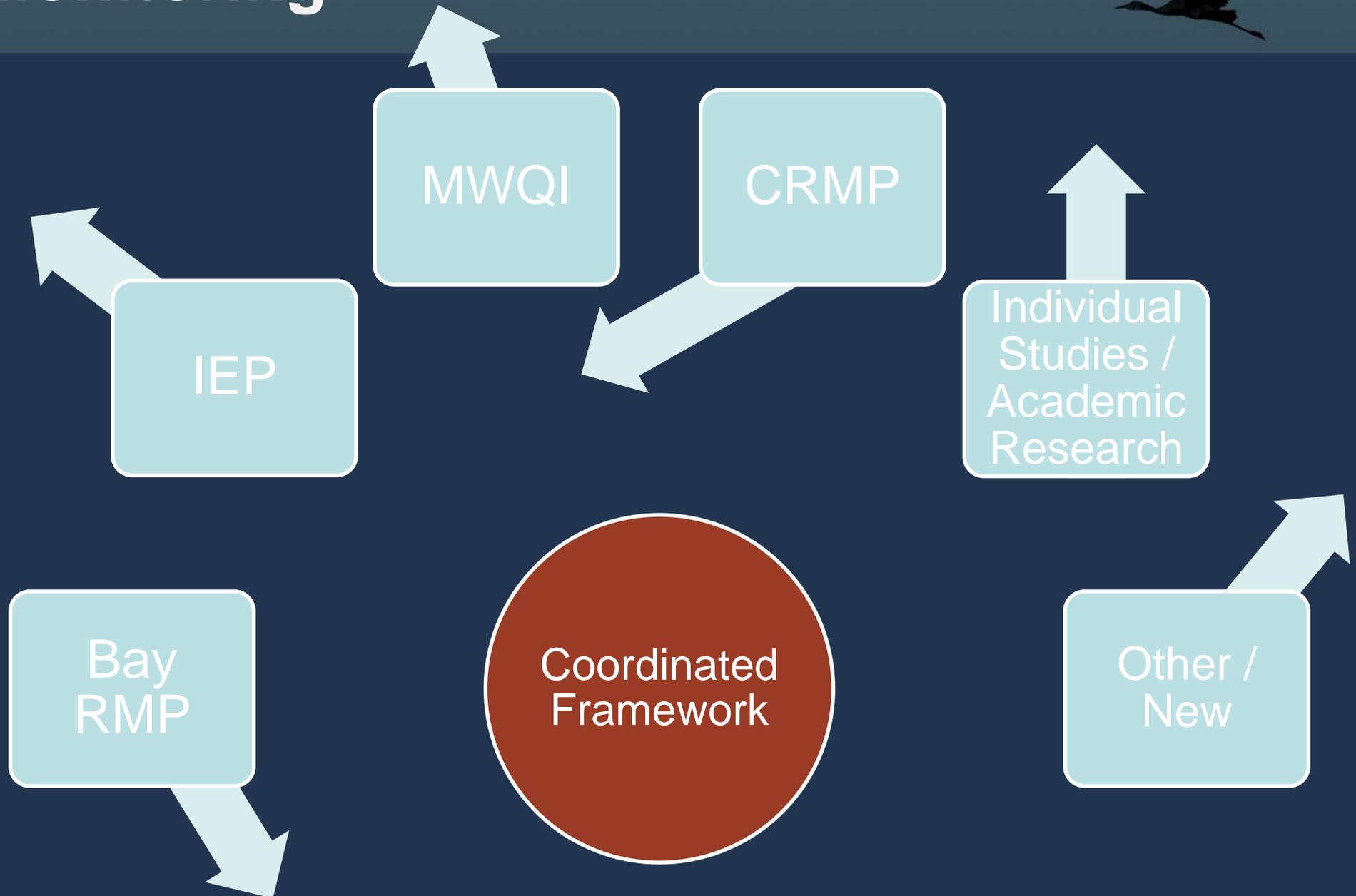
- Many valuable monitoring programs exist and new ones are coming online to provide the science to support decisions
- Each program has its own limited focus
- Coordination and integration among monitoring programs is key to supporting the Delta Stewardship Council's co-equal goals of the Delta Plan
- A unifying monitoring framework that integrates current ecological, hydrologic, and water quality monitoring programs is needed to ensure major Delta initiatives work together synergistically

Program of Implementation for the Bay-Delta WQCP is an Opportunity

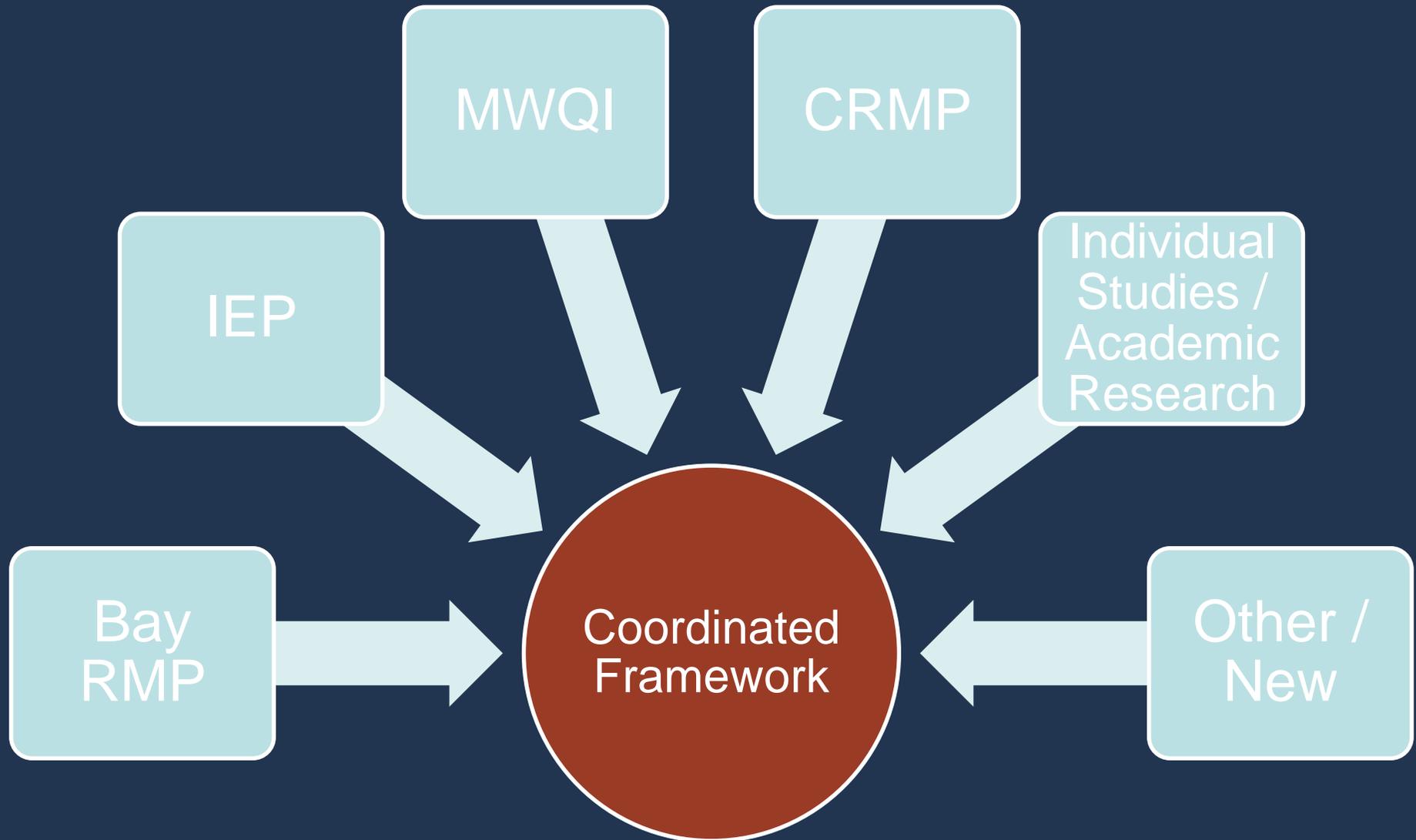


- To do so, State Water Board's implementation program should coordinate and integrate under an overarching scientific vision of Delta ecological and hydrologic function
- Effectively harness the data-generating power of multiple monitoring programs to produce information needed to most effectively evaluate the efficacy of new flow objectives

Where We Are Today with Delta Monitoring



Where We Need to Be with Delta Monitoring



State Water Board's Role



An effective program of implementation for the WQCP can rely on current and expanded Delta monitoring programs to provide the State Water Board with the data it needs to judge whether the flow objectives are producing the desired environmental conditions.

- WQCP Implementation Program should put forth monitoring requirements that make coordination among existing programs and integration among disciplines (water quality, hydrology, ecology) an emphasis.

Absent a Holistic Approach



Coordination of monitoring without a comprehensive, scientific Delta monitoring framework to direct such coordination – one that integrates ecological, hydrologic, and water quality data in search of fundamental relationships – will fall short of what is needed.

- Recent efforts to determine causal relationships between contaminants and POD were not fully successful due to fundamental deficiencies in the way monitoring has historically been conducted in the Delta.

(see Johnson et al. 2010; *Evaluation of Chemical, Toxicological, and Histopathologic Data to Determine Their Role in the Pelagic Organism Decline*).

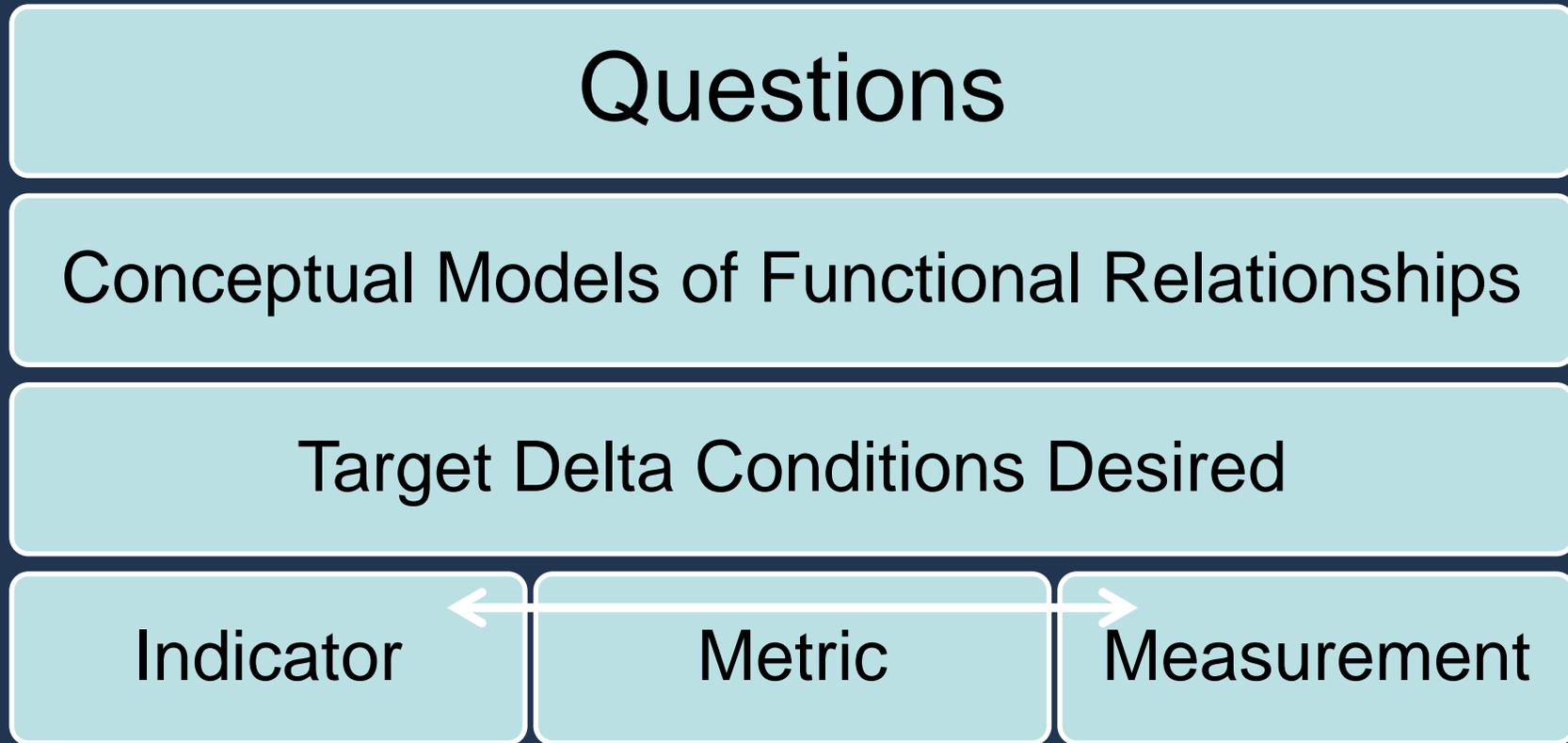
Components of a Framework



A comprehensive, scientific monitoring framework is needed that defines appropriate measures of Delta ecological health and how they are affected by flow, water quality, and species interactions (including those of invasive species).

- Such a framework would include:
 - Conceptual models of ecosystem function and the effects of CVP/SWP system operations, stressors, and climate change
 - Definition of desired ecological and water supply target conditions
 - Definition of performance metrics and measurements used to evaluate successful acquisition of desired target conditions
 - An adaptive management component that directs future actions/monitoring consistent with the framework and technical findings

An Example Delta Monitoring Framework



Adapted from: *Framework for a Unified Monitoring, Assessment and Reporting Program (UMARP) for the Bay-Delta 2010 Report.*
(Luoma et al. 2011)

Pesticide Example



Question: How will new Delta flow objectives affect pesticide levels in the Delta watershed?

Conceptual Model: Changes in system hydrodynamics could change the pattern of organism exposure to pesticides through change in the simultaneous occurrence of organisms and pesticides in time and space.

Target Condition: No pesticides in toxic amounts

Indicator

Metric

Measurement



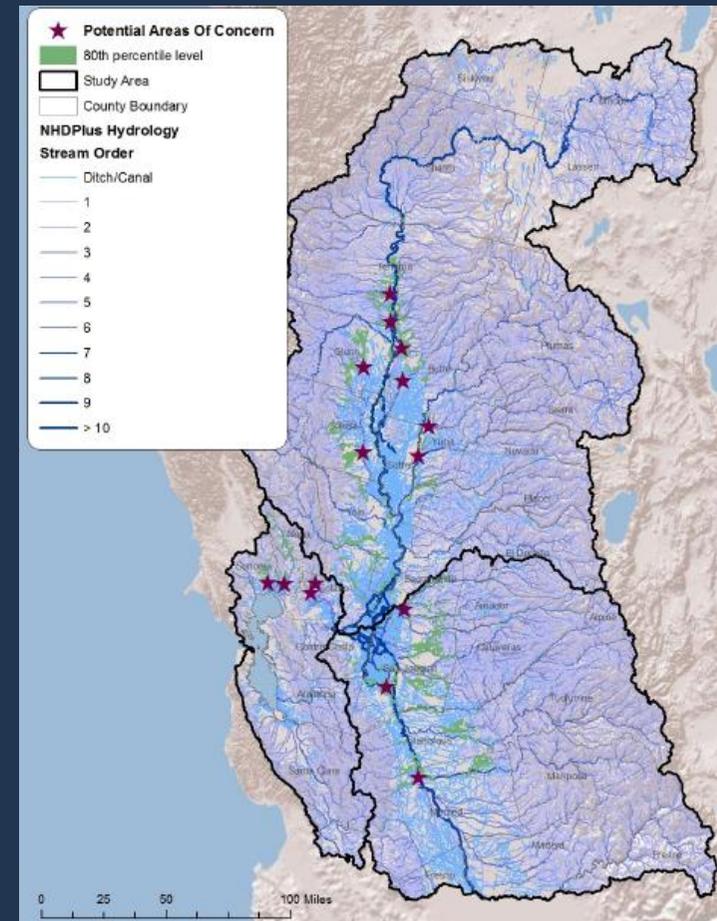
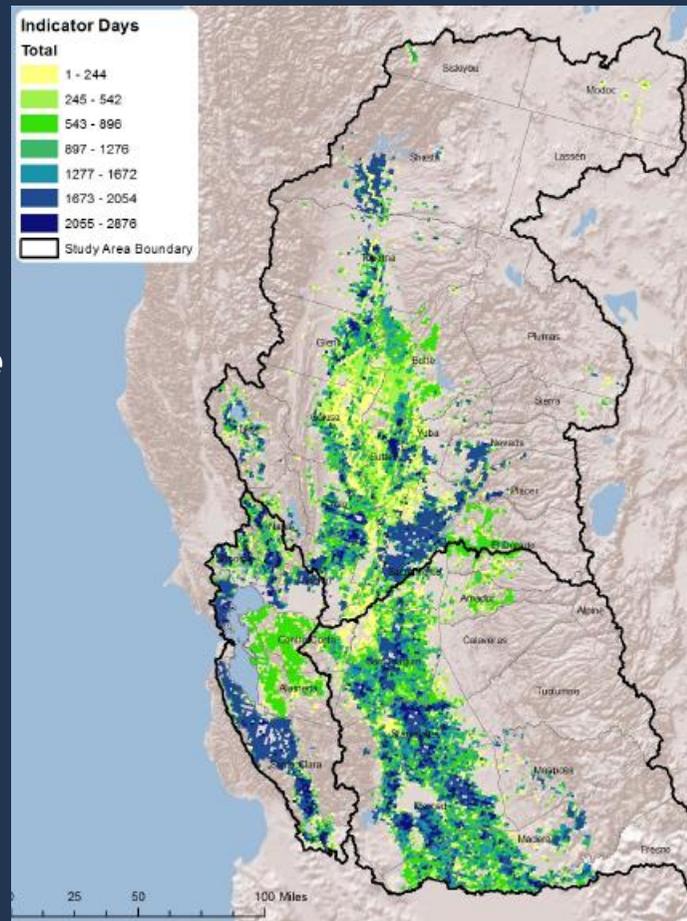
Tools and Studies will Inform Implementation Plan Development



- New models can inform and guide future monitoring efforts

Hoogeweg et al 2011;

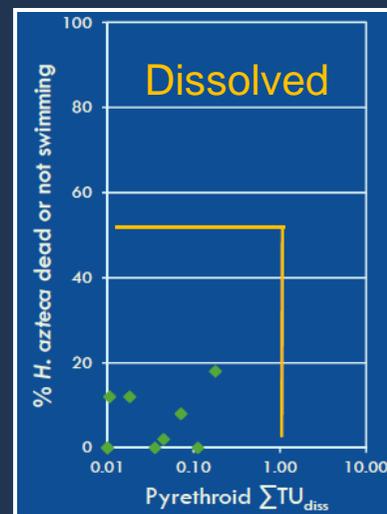
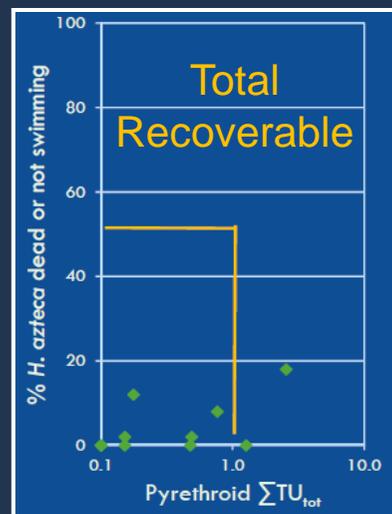
Spatial and Temporal Quantification of Pesticide Loadings to the Sacramento River, San Joaquin River, and Bay-Delta to Guide Risk Assessment for Sensitive Species



Tools and Studies will Inform Implementation Plan Development



- Decisions to engage in monitoring need to reflect the current state-of-the-science
- POTWs - Pyrethroid Insecticides, CECs
 - Pyrethroid studies by City of Vacaville and SRCSD demonstrates shortcoming of bioassays and the need to consider bioavailability



- CEC study by City of Vacaville demonstrates shortcomings in existing sample preparation and analysis methods, leading to considerable QA/QC issues related to CEC monitoring.

Recommendations



- WQCP Program of Implementation update is an opportunity to develop a comprehensive scientific Delta monitoring framework that includes the key questions the SWRCB needs to have answered
- Partner with the Delta Science Program and others to develop the framework
- Use adaptive management to refine the framework questions and the monitoring program elements over time

Recommendations (Cont.)



- Seek refinements in how/when you apply specific objectives
 - Current WQCP: Wet, AN, BN, D, C
 - Break adverse hydrologic trends while avoiding breaking the hydrologic bank